



October 21, 2016

Meagan E. Ormand Golder Associates Inc. 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227

RE: Project: Bremo Monthly Process Pace Project No.: 92316789

Dear Meagan Ormand:

Enclosed are the analytical results for sample(s) received by the laboratory on October 20, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Nicole Gasiorowski

Micolo Lassorouske

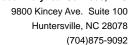
nicole.gasiorowski@pacelabs.com

Project Manager

Enclosures

cc: Ron DiFrancesco, Golder Associates Inc. Arielle Green, Golder Associates Inc. Martha Smith, Golder Associates Inc. Mike Williams, Golder Associates Inc







CERTIFICATIONS

Project: Bremo Monthly Process

Pace Project No.: 92316789

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174

Alabama Certification #: 41320 Connecticut Certification #: PH-0216

Delaware Certification: FL NELAC Reciprocity

Florida Certification #: E83079 Georgia Certification #: 955

Guam Certification: FL NELAC Reciprocity Hawaii Certification: FL NELAC Reciprocity

Illinois Certification #: 200068

Indiana Certification: FL NELAC Reciprocity

Kansas Certification #: E-10383

Louisiana Certification #: FL NELAC Reciprocity Louisiana Environmental Certificate #: 05007

Maryland Certification: #346 Michigan Certification #: 9911

Mississippi Certification: FL NELAC Reciprocity

Missouri Certification #: 236 Montana Certification #: Cert 0074 Nebraska Certification: NE-OS-28-14

Nevada Certification: FL NELAC Reciprocity

New York Certification #: 11608

North Carolina Environmental Certificate #: 667

North Carolina Certification #: 12710
Oklahoma Certification #: D9947
Pennsylvania Certification #: 68-00547
Puerto Rico Certification #: FL01264
South Carolina Certification: #96042001
Tennessee Certification #: TN02974
Texas Certification: FL NELAC Reciprocity

US Virgin Islands Certification: FL NELAC Reciprocity Virginia Environmental Certification #: 460165

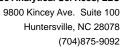
Wyoming Certification: FL NELAC Reciprocity

West Virginia Certification #: 9962C Wisconsin Certification #: 399079670

Wyoming (EPA Region 8): FL NELAC Reciprocity

Eden Certification IDs

205 East Meadow Road Suite A, Eden, NC 27288 North Carolina Drinking Water Certification #: 37738 North Carolina Wastewater Certification #: 633 Virginia/VELAP Certification #: 460025



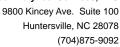


SAMPLE ANALYTE COUNT

Project: Bremo Monthly Process

Pace Project No.: 92316789

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory	
	_ <u>·</u>					
92316789001	T2-161019-1354-S3	ASTM D4282-02 EPA 200.7	KCE CKJ	8	PASI-E PASI-O	





PROJECT NARRATIVE

Project: Bremo Monthly Process

Pace Project No.: 92316789

Method: ASTM D4282-02 Description: Cyanide, Free

Client: Golder_Dominion_Bremo

Date: October 21, 2016

General Information:

1 sample was analyzed for ASTM D4282-02. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:



9800 Kincey Ave. Suite 100 Huntersville, NC 28078 (704)875-9092



PROJECT NARRATIVE

Project: Bremo Monthly Process

Pace Project No.: 92316789

Method: EPA 200.7
Description: 200.7 MET ICP

Client: Golder_Dominion_Bremo

Date: October 21, 2016

General Information:

1 sample was analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:

The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:

The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:

All criteria were within method requirements with any exceptions noted below.

Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:

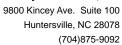
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.





ANALYTICAL RESULTS

Project: Bremo Monthly Process

Pace Project No.: 92316789

Date: 10/21/2016 07:00 PM

Sample: T2-161019-1354-S3	Lab ID: 923	16789001	Collected: 10/19/	16 13:54	Received: 10	0/20/16 13:40	Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Cyanide, Free	Analytical Meth	od: ASTM	D4282-02					
Cyanide, Free	ND	mg/L	0.050	1		10/21/16 09:30	57-12-5	
200.7 MET ICP	Analytical Meth	od: EPA 20	0.7 Preparation Me	thod: El	PA 200.7			
Aluminum	129	ug/L	100	1	10/21/16 13:06	10/21/16 16:4:	3 7429-90-5	
Barium	433	ug/L	10.0	1	10/21/16 13:06	10/21/16 16:43	3 7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/21/16 13:06	10/21/16 16:43	3 7440-41-7	
Boron	1800	ug/L	50.0	1	10/21/16 13:06	10/21/16 16:43	3 7440-42-8	
Cobalt	ND	ug/L	10.0	1	10/21/16 13:06	10/21/16 16:43	3 7440-48-4	
Iron	ND	ug/L	250	1	10/21/16 13:06	10/21/16 16:43	3 7439-89-6	
Molybdenum	197	ug/L	10.0	1	10/21/16 13:06	10/21/16 16:43	3 7439-98-7	
Vanadium	ND	ug/L	10.0	1	10/21/16 13:06	10/21/16 16:43	3 7440-62-2	



QUALITY CONTROL DATA

Project: Bremo Monthly Process

Pace Project No.: 92316789

Date: 10/21/2016 07:00 PM

QC Batch: 334125 Analysis Method: ASTM D4282-02

QC Batch Method: ASTM D4282-02 Analysis Description: ASTM D4282 Free Cyanide

Associated Lab Samples: 92316789001

METHOD BLANK: 1852064 Matrix: Water

Associated Lab Samples: 92316789001

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Cyanide, Free mg/L ND 0.050 10/21/16 09:30

LABORATORY CONTROL SAMPLE: 1852065

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Cyanide, Free mg/L 0.10 100 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1852066 1852067

MS MSD 92316789001 Spike Spike MS MSD MS MSD % Rec Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual Cyanide, Free ND 90-110 mg/L .1 .1 0.10 0.10 93 94 0

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALITY CONTROL DATA

Project: Bremo Monthly Process

Pace Project No.: 92316789

Date: 10/21/2016 07:00 PM

QC Batch: 327454 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET

Associated Lab Samples: 92316789001

METHOD BLANK: 1747975 Matrix: Water

Associated Lab Samples: 92316789001

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Aluminum	ug/L	ND	100	10/21/16 16:26	
Barium	ug/L	ND	10.0	10/21/16 16:26	
Beryllium	ug/L	ND	1.0	10/21/16 16:26	
Boron	ug/L	ND	50.0	10/21/16 16:26	
Cobalt	ug/L	ND	10.0	10/21/16 16:26	
Iron	ug/L	ND	250	10/21/16 16:26	
Molybdenum	ug/L	ND	10.0	10/21/16 16:26	
Vanadium	ug/L	ND	10.0	10/21/16 16:26	

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	2500	2570	103	85-115	
Barium	ug/L	250	263	105	85-115	
Beryllium	ug/L	25	26.2	105	85-115	
Boron	ug/L	2500	2460	98	85-115	
Cobalt	ug/L	250	253	101	85-115	
Iron	ug/L	2500	2660	106	85-115	
Molybdenum	ug/L	250	246	98	85-115	
Vanadium	ug/L	250	255	102	85-115	

MATRIX SPIKE & MATRIX SPI	KE DUPLICAT	E: 17479	77		1747978						
			MS	MSD							
	923	316789001	Spike	Spike	MS	MSD	MS	MSD	% Rec		
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	Qual
Aluminum	ug/L	129	2500	2500	2700	2770	103	106	70-130		
Barium	ug/L	433	250	250	702	710	107	111	70-130	1	
Beryllium	ug/L	ND	25	25	26.2	26.2	104	104	70-130	0	
Boron	ug/L	1800	2500	2500	4340	4200	102	96	70-130	3	
Cobalt	ug/L	ND	250	250	244	242	98	97	70-130	1	
Iron	ug/L	ND	2500	2500	2700	2770	105	108	70-130	2	
Molybdenum	ug/L	197	250	250	445	437	99	96	70-130	2	
Vanadium	ug/L	ND	250	250	259	260	102	102	70-130	0	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



QUALIFIERS

Project: Bremo Monthly Process

Pace Project No.: 92316789

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

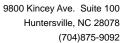
TNI - The NELAC Institute.

LABORATORIES

Date: 10/21/2016 07:00 PM

PASI-E Pace Analytical Services - Eden

PASI-O Pace Analytical Services - Ormond Beach





QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo Monthly Process

Pace Project No.: 92316789

Date: 10/21/2016 07:00 PM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92316789001	T2-161019-1354-S3	ASTM D4282-02	334125		· · · · · · · · · · · · · · · · · · ·
92316789001	T2-161019-1354-S3	EPA 200.7	327454	EPA 200.7	327498

Face Analytical*

Document Name: Sample Condition Upon Receipt(SCUR)

Document No.: F-MEC-CS-009-Rev.03 Document Revised: May 24, 2016 Page 1 of 2

Issuing Authority: Pace Mechanicsville Quality Office

Courier: Commercial Client Name: Fed Ex Pace	BVUVI DUSF			Project # WO#: 92316789
Custody Seal Present? Yes No Se	als Intact?	√Y.	es [No 10-20-1/a
Thermometer: RMD001 Correction Factor: 0.0°C Cooler Temp Corrected ('Temp should be above freezing to 6°C USDA Regulated Soil (N/A, water sample)			₩et	Date/Initials Person Examining Contents: 10-20-16 Other: SB Samples on ice, cooling process has begun Biological Tissue Frozen? Yes No N/A
Did samples originate in a quarantine zone within the Unit	ed States: CA	, NY, or !	SC (check	maps)? Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? Yes No
				Comments/Discrepancy:
Chain of Custody Present?	√ ,Yes	□No	□N/A	1.
Samples Arrived within Hold Time?	Yes	□No	□N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐,Yes	No	□N/A	3.
Rush Turn Around Time Requested?	Yes	□No	□N/A	4.
Sufficient Volume?	Yes	□No	□n/a	5.
Correct Containers Used?	Yes	□No	□N/A	6.
-Pace Containers Used?	□Yes	□No	₩N/A	
Containers Intact?	Yes	□No	□n/a	7.
Samples Field Filtered?	Wes	□No	□N/A	8. Note if sediment is visible in the dissolved container
Sample Labels Match COC?	Yes	□No	□N/A	9.
-Includes Date/Time/ID/Analysis Matrix:	N			
All containers needing acid/base preservation have been checked? All containers needing preservation are found to be in	□Yes	No	MN/A	10. _{HNC3 pH<2} на pH<2
compliance with EPA recommendation? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH >9 Sulfide, NaOH>12 Cyanide) Exceptions : VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	□Yes	□No	DN/A	H2SO4 pH<2 NaOH pH>12 NaOH/ZnOAc pH>9
Samples checked for dechlorination?	Yes	□No	DIN/A	11.
Headspace in VOA Vials (>5-6mm)?	□Yes	□No	N/A	12.
Trip Blank Present?	□Yes	□No	MN/A	13.
Trip Blank Custody Seals Present?	☐Yes	□N ₀	N/A	a contract of the contract of
Pace Trip Blank Lot # (if purchased):				
CLIENT NOTIFICATION/RESOLUTION				Field Data Required? ☐Yes ☐No
Person Contacted: Comments/Sample Discrepancy:				Date/Time:
Project Manager SCURF Review:	r	Vmc		Date: 10/21/16
Project Manager SRF Review: Note: Whenever there is a discrepancy affecting North Caro Out of hold, incorrect preservative, out of temp, incorrect co		NW e sample		Date: 102116 of this form will be sent to the North Carolina DEHNR Certification Office (i.e.

ace Analytical"

CHAIN-OF-CUST Y / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

sample IDs MUST BE UNIQUE tion D uired Client Information F-551-0129 ent Information: ue Date/TAT: be performed under Golder-Pace MSA dated Mormand@golder.com Richmond, VA 23227 2108 W Laburnum Ave, Ste 200 Golder Associates SAMPLE ID ADDITIONAL COMMENTS 12-161019-1354-53 24 DUR Fax: 804-358-2900 3-Day Valid Matrix Codes

MATRIX

CODE

CRUNKIN WATER

WATER

WATER

WASTE WATER

WASTE WATER

WASTE WATER

WASTE WATER

WASTE WATER

WASTE WATER

AR

OTHER

AR

OTHER

OTHER

OTHER

TISSUE

TS Required Project Information: Project Number: Project Name: Purchase Order No.: Copy To: Martha_Smith@golder.com Report To: Mormand@golder.com Ron_Difrancesco@golder.com WW RELINQUISHED BY I AFFILIATION MATRIX CODE (see valid codes to left) 1520-347,226 Bremo Monthly Compliance 0 SAMPLE TYPE (G=GRAB C=COMP) DATE COMPOSITE SAMPLER NAME AND SIGNATURE 200 TIME COLLECTED (rolde, PRINT Name of SAMPLER: SIGNATURE of SAMPLER: 10114114 DATE COMPOSITE END/GRAB Pores 13:54 TIME DATE SAMPLE TEMP AT COLLECTION Address: Pace Quote Reference: Company Name: Pace Project 1345 # OF CONTAINERS TIME Unpreserved かんさく think man H₂SO₄ Preservatives HNO₃ gaiapdataentry_invoices@golder.com Meagan Ormand Golder Associates HCI NaOH Na₂S₂O₃ ACCEPTED BY AFFILIATION Methanol Other Y/N. ↓ Analysis Test
↓ 200.7 - Al, Ba, Be, B, Co DATE Signed (MM/DD/YY): Requested Analysis Filtered (Y/N) 200.7 - Fe, Mo, V ASTM4282 - Free Cyanid REGULATORY AGENCY Site Location TSU NPDES DATE STATE: 5 61530 RCRA TIME GROUND WATER 240 Page: X Temp in °C Residual Chlorine (Y/N) Received on Pace Project No./ Lab I.D. ice (Y/N) SAMPLE CONDITIONS 92316789 õ OTHER DRINKING WATER Custody Sealed Cooler (Y/N) Samples Intact (Y/N) 12 of 12 00198589e